Microsemi

SCOTTSDALE DIVISION

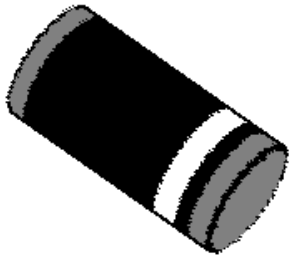
TGL41-6.8 thru TGL41-200CA

500 Watt Transient Voltage Suppressor

DESCRIPTION

This series of 500 W Transient Voltage Suppressors (TVSs) provides the highest level of Peak Pulse Power (P_{PP}) in the industry for the DO-213AB size MELF package. These P_{PP} levels offer protection from switching transients, induced RF, secondary lightning, as well as ESD or EFT where these devices are also compliant to IEC61000-4-2 and IEC61000-4-4. In addition to unidirectional TVS configurations, this series also offers bidirectional options with C or CA suffix. Its configuration in a MELF package prevents lead damage to terminals and also reduces inductive parasitics for minimal transient voltage overshoots.

APPEARANCE



DO-213AB

IMPORTANT: For the most current data, consult *MICROSEMI's* website: **http://www.microsemi.com**

FEATURES

- Economical series for 500 Watt Surface Mount transient voltage suppressor.
- Available in Both Unidirectional and Bidirectional Construction. Bidirectional has a C or CA suffix.
- 6.8 to 200 Volts Available.
- 500 Watts Peak Power Dissipation.
- Fast Response Time: Subnanosecond Response (Unipolar) or 5.0 ns (Bipolar).
- Plastic package has flame retardant epoxy meeting UL94V-0

APPLICATIONS / BENEFITS

- For Surface Mount Applications
- Protection from switching transients, induced RF, secondary lightning, as well as ESD, and EFT per IEC 61000-4-2 and IEC 6100-4-4
- Very low inductive parasitics with minimal Ldi/dt voltage overshoots for fast-rise-time transients
- Robust package for pick-and-place handling

MAXIMUM RATINGS @ 25°C*

- Peak Pulse Power Dissipation (P_{PP}) - 500 W (Note 1 & 5).
- Peak Forward Surge Current (I_{FSM}) - 40 A (Note 3)
- Peak Pulse Current (I_{PP}) at 10/1000 µs waveform - see Table 1 (Note 1)
- Steady-State Power Dissipation, $P_{(AV)}$ - 3.0W (Note 2, 4)
- Operating and Storage temperatures, T_{OP}, T_{STG} – (-55°C to +150°C)
- Thermal Resistance junction to end cap ($R_{?JEC}$) – 15°C/W

MECHANICAL AND PACKAGING

- Molded epoxy package meets UL94V-0
- End-Cap terminals solderable per MIL-STD-750, Method 2026 (max 260°C for 10 seconds.
- Polarity is indicated by cathode band. Bidirectional devices have no polarity band.
- Body marked with P/N without TGL41 prefix.
- Weight: 0.06 grams (approximate)
- Tape and Reel packaging per EIA-481-2 with 12 mm tape with 5000 per 13 inch reel.

* Unless otherwise specified.

NOTES:

1. Non-repetitive current pulse, per Figure 3 and derated above TA = 25°C per Figure 2.
2. Mounted on 4.0 mm^2 copper pads to each terminal. (See Figure 3)
3. 8.3 ms single half-sine wave duty cycle = 4 pulses per minute max. Peak forward voltage at 40 A is 3.5 volts (unipolar only)
4. Derate linearly above 100°C to zero at 150°C for dc steady-state power. Also see Figure 2 for transient derating.
5. Peak pulse current waveform is 10/1000 µs, with maximum duty cycle of 0.01%. (See Figure 4)

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ELECTRICAL CHARACTERISTICS @ 25°C

MICROSEMI PART NUMBER	BREAKDOWN VOLTAGE $V_{(BR)}$ MIN.	NOM.	MAX.	TEST CURRENT $I_{(BR)}$	RATED STAND-OFF VOLTAGE V_{WM}	MAX REVERSE LEAKAGE CURRENT I_D @ V_{WM}	MAX. CLAMPING VOLTAGE V_C @ I_{PP}	MAX. PEAK PULSE CURRENT I_{PP}	MAX. TEMP COEFFICIENT $\alpha_{V(BR)}$
	V	V	V	mADC	V	mA	V	A	%/°C
TGL41-6.8	6.12	6.8	7.48	10	5.5	1000	10.8	46.3	.057
TGL41-6.8A	6.45	6.8	7.14	10	5.8	1000	10.5	47.6	.057
TGL41-7.5	6.75	7.5	8.25	10	6.05	500	11.7	42.7	.061
TGL41-7.5A	7.13	7.5	7.88	10	6.4	500	11.3	44.2	.061
TGL41-8.2	7.38	8.2	9.02	10	6.63	200	12.5	40.0	.065
TGL41-8.2A	7.79	8.2	8.61	10	7.02	200	12.1	41.3	.065
TGL41-9.1	8.19	9.1	10	1	7.37	50	13.8	36.2	.068
TGL41-9.1A	8.65	9.1	9.55	1	7.78	50	13.4	37.3	.068
TGL41-10	9.0	10	11	1	8.1	10	15	33.3	.073
TGL41-10A	9.5	10	10.5	1	8.55	10	14.5	34.5	.073
TGL41-11	9.9	11	12.1	1	8.92	5	16.2	30.9	.075
TGL41-11A	10.5	11	11.6	1	9.4	5	15.6	32.1	.075
TGL41-12	10.8	12	13.2	1	9.72	5	17.3	28.9	.078
TGL41-12A	11.4	12	12.6	1	10.2	5	16.7	29.9	.078
TGL41-13	11.7	13	14.3	1	10.5	5	19	26.3	.081
TGL41-13A	12.4	13	13.7	1	11.1	5	18.2	27.5	.081
TGL41-15	13.5	15	16.5	1	12.1	5	22	22.7	.084
TGL41-15A	14.3	15	15.8	1	12.8	5	21.2	23.6	.084
TGL41-16	14.4	16	17.6	1	12.9	5	23.5	21.3	.086
TGL41-16A	15.2	16	16.8	1	13.6	5	22.5	22.2	.086
TGL41-18	16.2	18	19.8	1	14.5	5	26.5	18.5	.088
TGL41-18A	17.1	18	18.9	1	15.3	5	25.2	19.8	.088
TGL41-20	18	20	22	1	16.2	5	29.1	17.2	.090
TGL41-20A	19	20	21	1	17.1	5	27.7	18.1	.090
TGL41-22	19.8	22	24.2	1	17.8	5	31.9	15.7	.092
TGL41-22A	20.9	22	23.1	1	18.8	5	30.6	16.3	.092
TGL41-24	21.6	24	26.4	1	19.4	5	34.7	14.4	.094
TGL41-24A	22.8	24	25.2	1	20.5	5	33.2	15.1	.094
TGL41-27	24.3	27	29.7	1	21.8	5	39.1	12.8	.096
TGL41-27A	25.7	27	28.4	1	23.1	5	37.5	13.3	.096
TGL41-30	27	30	33	1	24.3	5	43.5	11.5	.097
TGL41-30A	28.5	30	31.5	1	25.6	5	41.4	12.1	.097
TGL41-33	29.7	33	36.3	1	26.8	5	47.7	10.5	.098
TGL41-33A	31.4	33	34.7	1	28.2	5	45.7	10.9	.098
TGL41-36	32.4	36	39.6	1	29.1	5	52	9.6	.099
TGL41-36A	34.2	36	37.8	1	30.8	5	49.9	10.0	.099
TGL41-39	35.1	39	42.9	1	31.6	5	56.4	8.9	.100
TGL41-39A	37.1	39	41	1	33.3	5	53.9	9.3	.100
TGL41-43	38.7	43	47.3	1	34.8	5	61.9	8.1	.101
TGL41-43A	40.9	43	45.2	1	36.8	5	59.3	8.4	.101
TGL41-47	42.3	47	51.7	1	38.1	5	67.8	7.4	.101
TGL41-47A	44.7	47	49.4	1	40.2	5	64.8	7.7	.101
TGL41-51	45.9	51	56.1	1	41.3	5	73.5	6.8	.102
TGL41-51A	48.5	51	53.6	1	43.6	5	70.1	7.1	.102
TGL41-56	50.4	56	61.6	1	45.4	5	80.5	6.2	.103
TGL41-56A	53.2	56	58.8	1	47.8	5	77	6.5	.103
TGL41-62	55.8	62	68.2	1	50.2	5	89	5.6	.104
TGL41-62A	58.9	62	65.1	1	53	5	85	5.9	.104
TGL41-68	61.2	68	74.8	1	55.1	5	98	5.1	.104
TGL41-68A	64.6	68	71.4	1	58.1	5	92	5.4	.104
TGL41-75	67.5	75	82.5	1	60.7	5	108	4.6	.105
TGL41-75A	71.3	75	78.8	1	64.1	5	103	4.9	.105
TGL41-82	73.8	82	90.2	1	66.4	5	118	4.2	.105
TGL41-82A	77.9	82	86.1	1	70.1	5	113	4.4	.105
TGL41-91	81.9	91	100	1	73.7	5	131	3.8	.106
TGL41-91A	86.5	91	95.5	1	77.8	5	125	4.0	.106

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MICROSEMI PART NUMBER	BREAKDOWN VOLTAGE $V_{(BR)}$ MIN.	NOM.	MAX.	TEST CURRENT $I_{(BR)}$	RATED STAND-OFF VOLTAGE V_{WM}	MAX REVERSE LEAKAGE CURRENT I_D @ V_{WM}	MAX. CLAMPING VOLTAGE V_C @ I_{PP}	MAX. PEAK PULSE CURRENT I_{PP}	MAX. TEMP COEFFICIENT $\alpha_{V(BR)}$
	V	V	V	mA	V	mA	V	A	%/°C
TGL41-100	90	100	110	1	81	5	144	3.5	.106
TGL41-100A	95	100	105	1	85.5	5	137	3.6	.106
TGL41-110	99	110	121	1	89.2	5	158	3.2	.107
TGL41-110A	105	110	116	1	94	5	152	3.3	.107
TGL41-120	108	120	132	1	97.2	5	173	2.9	.107
TGL41-120A	114	120	126	1	102	5	165	3.0	.107
TGL41-130	117	130	143	1	105	5	187	2.7	.107
TGL41-130A	124	130	137	1	111	5	179	2.8	.107
TGL41-150	135	150	165	1	121	5	215	2.3	.108
TGL41-150A	143	150	158	1	128	5	207	2.4	.108
TGL41-160	144	160	176	1	130	5	230	2.2	.108
TGL41-160A	152	160	168	1	136	5	219	2.3	.108
TGL41-170	153	170	187	1	138	5	244	2.0	.108
TGL41-170A	161	170	179	1	145	5	234	2.1	.108
TGL41-180	162	180	198	1	146	5	258	1.9	.108
TGL41-180A	171	180	189	1	154	5	246	2.0	.108
TGL41-200	180	200	220	1	162	5	287	1.7	.108
TGL41-200A	190	200	210	1	171	5	274	1.8	.108

For Bidirectional construction, indicate a C or CA suffix after part number. Capacitance will be ½ that shown in Fig 3.
Forward Voltage (Vf) @ 40 amps peak 8.3 ms half-sine wave equal to 3.5 volts max (For Unidirectional only).

SYMBOLS & DEFINITIONS

Symbol	Definition	Symbol	Definition
V_{WM}	Rated Stand-Off voltage	$V_{(BR)}$	Breakdown Voltage
I_{PP}	Peak Pulse Current	$I_{(BR)}$	Breakdown Current
P_{PP}	Peak Pulse Power	I_D	Standby Current

OUTLINE AND CIRCUIT

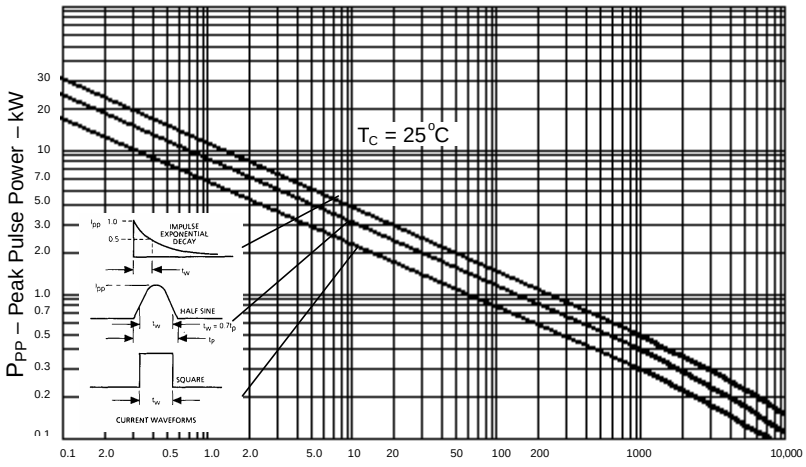

FIGURE 1
Peak Pulse Power vs. Pulse Width

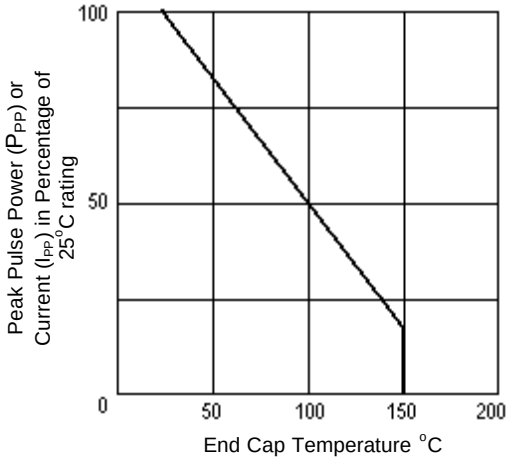

FIGURE 2
Derating Curve

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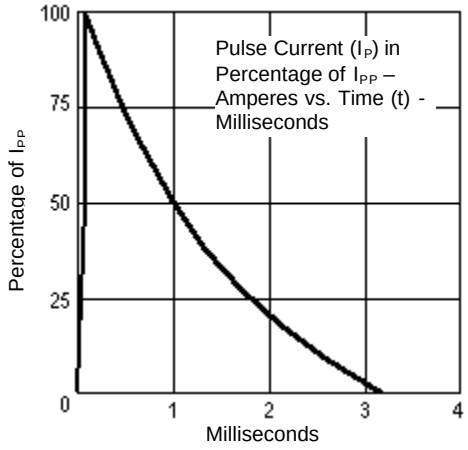


FIGURE 3

Pulse Waveform for Exponential Surge

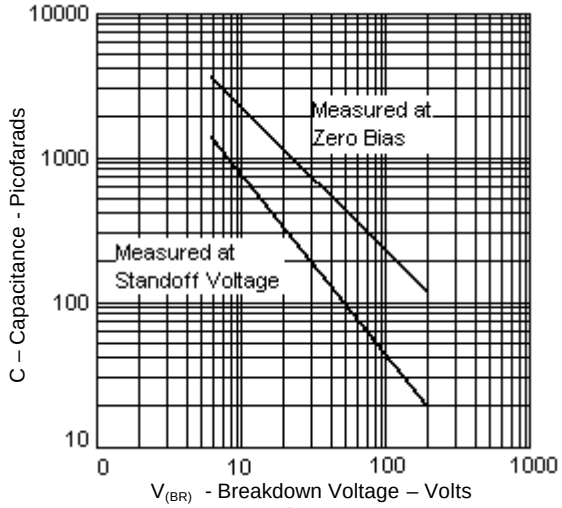
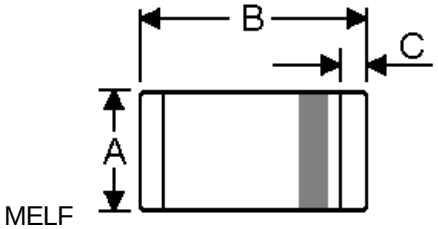


FIGURE 4

Typical Capacitance vs. Breakdown Voltage (Unidirectional only)
Bidirectional Suffix C devices are ½ that shown.

DIMENSIONS AND LAYOUT



MELF
DO-213AB

DIM	MILLIMETERS		INCHES	
	MIN	MAX	MIN	MAX
A	2.39	2.66	0.094	0.102
B	4.80	5.20	0.189	0.205
C	0.41	0.55	0.016	0.022

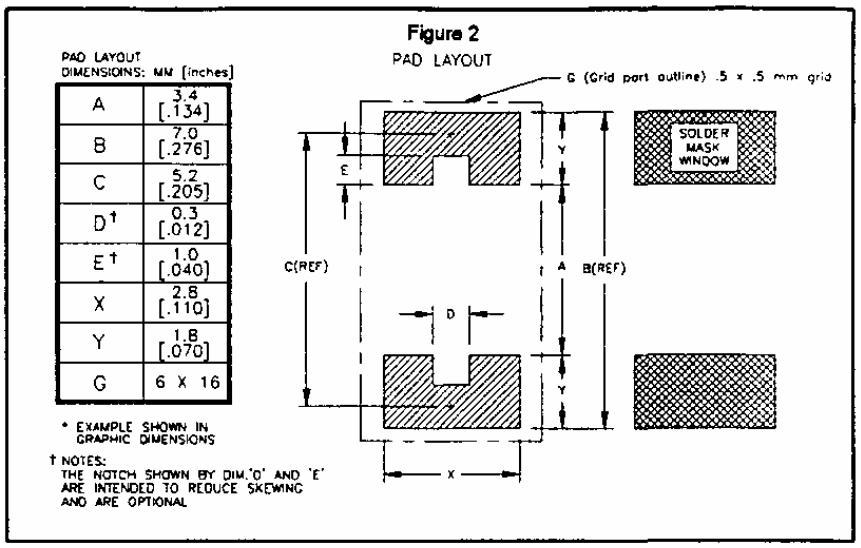


Figure 2
PAD LAYOUT
PAD LAYOUT DIMENSIONS: MM [inches]
A 3.4 [.134]
B 7.0 [.276]
C 5.2 [.205]
D† 0.3 [.012]
E† 1.0 [.040]
X 2.8 [.110]
Y 1.8 [.070]
G 6 X 16
G (Grid part outline) .5 x .5 mm grid
SOLDER MASK WINDOW
C(REF)
B(REF)
* EXAMPLE SHOWN IN GRAPHIC DIMENSIONS
† NOTES: THE NOTCH SHOWN BY DIM.'D' AND 'E' ARE INTENDED TO REDUCE SKEWING AND ARE OPTIONAL

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